

Abstract

Method for producing a deep trench capacitor in a semiconductor substrate

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The present invention provides a method for producing a deep trench capacitor in a semiconductor substrate ~~(1)~~ comprising ~~the steps of:~~ including providing a first trench ~~(2)~~ in the semiconductor substrate ~~(1)~~, oxidizing the semiconductor substrate ~~(1)~~ in the first trench ~~(2)~~ for providing an oxidized silicon layer ~~(3)~~, depositing a conformal aluminium-oxide layer ~~(4)~~ in the first trench ~~(2)~~, removing the horizontal regions ~~(5)~~ of the deposited aluminium-oxide layer ~~(4)~~ and the oxidized silicon layer ~~(3)~~, providing a second trench (6) underneath the first trench ~~(2)~~, increasing the width of the second trench ~~(6)~~ to a widened second trench ~~(7)~~ for providing a bottle structure ~~(8)~~, depositing a dielectric layer ~~(10)~~ in the widened second trench ~~(7)~~ and filling the widened second trench ~~(7)~~ with a conductive filling ~~(11)~~.

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~~(Fig. 2h)~~

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